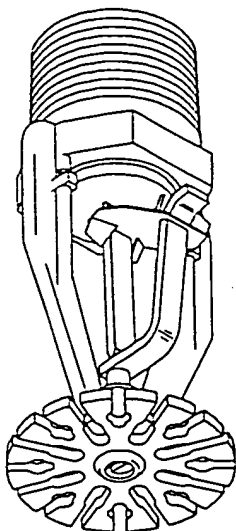




# EARLY SUPPRESSION FAST RESPONSE SPRINKLERS

## MODEL ESFR-25™

PENDENT, 25.2 K-FACTOR, 1 INCH NPT\*\*

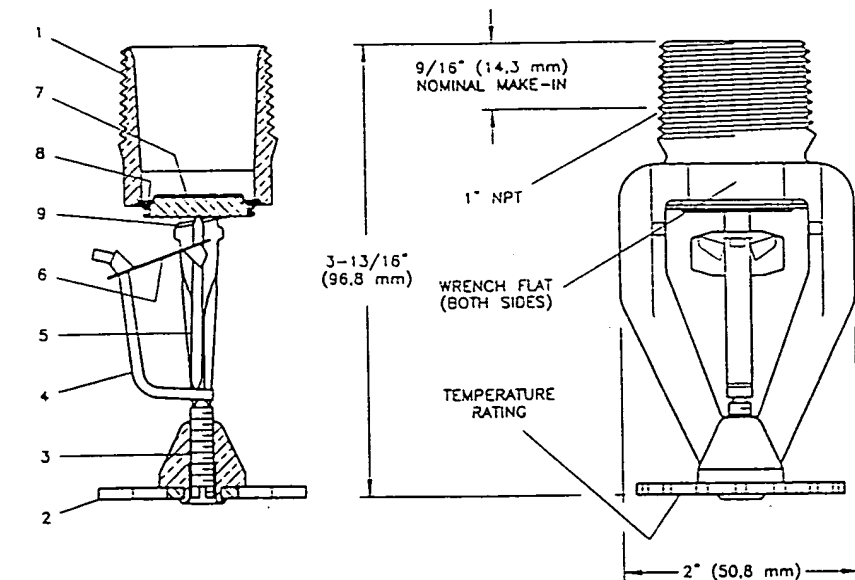


### GENERAL DESCRIPTION

The 25.2 K-Factor, Model ESFR-25™ Pendent Sprinklers (Ref. Figure A) are "Early Suppression Fast Response Sprinklers". They are suppression mode sprinklers, and their use is especially advantageous as a means of eliminating the use of in-rack sprinklers, when protecting high-piled storage.

The Model ESFR-25 is primarily designed for use with storage heights of most encapsulated or non-encapsulated common materials including cartoned unexpanded plastics of up to 40 ft. (12.2 m) and with ceiling heights of up to 45 ft. (13.7 m). In addition, the protection of some storage arrangements of roll paper and rubber tires can be considered as well.

The ESFR-25 provides the system designer with hydraulic and sprinkler placement options not presently available to the traditional ESFR sprinklers having a nominal K-Factor of 14.0. In particular, the Model ESFR-25 has been designed to operate at substantially lower end head pressures, as compared to ESFR sprinklers having a nominal K-Factor of 14.0. This feature offers flexibility when sizing the system piping, as well as possibly reducing or eliminating the need for a system fire pump. Also, the Model ESFR-25 per-



- 1-Frame
- 2-Deflector
- 3-Compression Screw

- 4-Hook
- 5-Strut
- 6-Link Assembly

- 7-Button
- 8-Gasketed Spring Plate
- 9-Ejection Spring

\*\* Pipe thread connections per ISO 7/1 can be provided on special request.

FIGURE A  
25.2 K-FACTOR, MODEL ESFR-25 (SIN G8441)  
PENDENT SPRINKLER ASSEMBLY

mits use of a maximum deflector-to ceiling distance of 18 inches (460 mm) versus 14 inches (360 mm); and, a storage arrangement of up to 40 ft. (12.2 m) with a ceiling height of up to 45 ft. (13.7 m) does not require in-rack sprinklers as do ESFR sprinklers having a nominal K-Factor of 14.0.

The Model ESFR-25 Pendent Sprinkler is also Listed by Underwriters Laboratories Inc. (UL) and by UL for use in Canada (C-UL) as a "Specific Application Early Suppression Fast Response Sprinkler" as indicated under the UL and C-UL Specific Application Design Criteria section. The specific application listing provides for reduced pressure design for the protection of certain commodities.

Applications for the Model ESFR-25 Sprinklers are expanding beyond the current recognized installation standards. For information regarding research fire tests which may be accept-

able to an Authority Having Jurisdiction (e.g., flammable liquids, exposed plastics, and aerosols), please contact the Technical Services Department.

### APPROVALS AND STANDARDS

The Model ESFR-25 Sprinklers are listed by Underwriter's Laboratories, Inc. (UL) and by Underwriters Laboratories, Inc. for use in Canada (C-UL), as well as approved by Factory Mutual Research Corporation. The listings and approval only apply to the service conditions indicated in the Design Criteria section.

#### WARNING

*The Model ESFR-25 Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities*

having jurisdiction (e.g., Factory Mutual Research Corporation). Failure to do so may impair the integrity of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or manufacturer should be contacted relative to any questions.

## TECHNICAL DATA

The Model ESFR-25 Pendent Sprinklers are rated for use at a maximum service pressure of 175 psi (12.1 bar). They are available in 165°F/74°C and 214°F/101°C temperature ratings with a natural brass finish.

The flow "Q" in GPM (LPM) is determined by the formula:

$$Q = K\sqrt{p}$$

where the nominal sprinkler discharge coefficient "K" = 25.2 (362.9); and "p" equals the residual flowing pressure in psi (bar).

The sprinkler Frame is a dezincification resistant bronze alloy; the Strut and Hook are Monel; the Deflector and Compression Screw are phosphor bronze; and, the Button is commercial bronze. The two halves of the Link Assembly are nickel and the Ejection Spring is Inconel wire. The Gasketed Spring Plate consists of a beryllium nickel disc spring that is sealed on both its inside and outside edges with a Teflon<sup>®</sup> gasket.

The Link Assembly has a thin, black resin type coating which will protect the Link Assembly from deterioration which could otherwise be caused by normal atmospheres. The coating is not intended to provide protection against attack by corrosive media.

## DESIGN CRITERIA

### UL and C-UL Listing Criteria

The Model ESFR-25 Sprinklers are UL and C-UL Listed as "Early Suppression Fast Response Sprinklers" for installation per NFPA 13 or other applicable NFPA standards.

### UL and C-UL Specific Application Listing Criteria

The Model ESFR-25 Sprinklers are UL and C-UL Listed as "Specific Application Early Suppression Fast Response Sprinklers" for use in accordance with NFPA 13 to protect single-, double-, and multiple row rack storage and palletized and solid pile storage (no open containers or solid shelves) of Class I, II, III, and IV commodities encapsulated or unencapsulated and cartoned Group A unexpanded plastics when installed with the following storage and ceiling heights and minimum design pressures:

Maximum Storage Height, Ft. (m)	Maximum Ceiling Height, Ft. (m)	Minimum Flowing Pressure, psi (bar)
40 (12.2)	45 (13.7)	40 (2.7)
35 (10.7)	40 (12.2)	25 (1.7)
30 (9.1)	35 (10.7)	20 (1.4)
25 (7.6)	30 (9.1)	15 (1.0)

When applying the specific application listing criteria, the Model ESFR-25 Sprinklers should be installed using the same installation obstruction and construction criteria, as well as deflector-to ceiling distances, as is applicable for Early Suppression Fast Response Sprinklers having a nominal K-Factor of 25.2 per NFPA 13.

### FM Approval Criteria

The Model ESFR-25 Sprinklers are FM Approved as "Early Suppression Fast Response Sprinklers" for installation per the applicable FM Loss Prevention Data Sheets.

## INSTALLATION

The Model ESFR-25 Pendent Sprinklers are to be installed in accordance with the following instructions:

### NOTE

*Damage to the fusible Link Assembly during installation can be avoided by handling the sprinkler by the frame arms only (i.e., do not apply pressure to the fusible Link Assembly), and by using the appropriate sprinkler wrench. Damaged sprinklers must be replaced.*

*A leak tight 1 inch NPT sprinkler joint should be obtained with a torque of 20 to 30 ft.lbs. (26.8 to 40.2 Nm). Higher levels of torque may distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.*

1. The ESFR-25 Sprinkler must be installed in the pendent position.
2. With pipe thread sealant applied, hand tighten the sprinkler into the sprinkler fitting. Do not apply pressure to the Link Assembly, and handle the ESFR-25 Sprinkler only by the Frame arms.
3. Wrench tighten the ESFR-25 Sprinkler using only the W-Type 1 Sprinkler Wrench (Ref. Figure B) and by fully engaging (seating) the wrench with the sprinkler wrench flats.
4. After installation, inspect the Link Assembly of each ESFR-25 Sprinkler for damage. In particular, verify that the Link Assembly and Hook are positioned as illustrated in Figure A, and that the Link Assembly has not been bent, creased, or forced out of its normal position in any way.

Damaged sprinklers must be replaced.

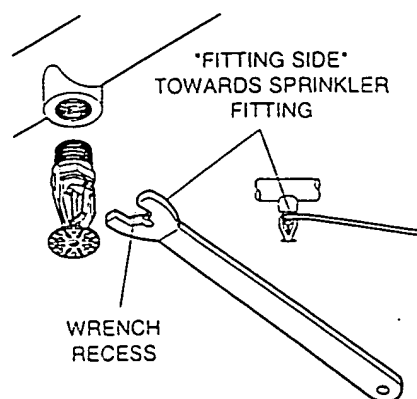


FIGURE B  
W-TYPE 1  
SPRINKLER WRENCH

## CARE AND MAINTENANCE

Automatic sprinklers must never be shipped or stored where their temperatures will exceed 100°F/38°C and they must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified or over-heated sprinklers must be replaced.

Care must be exercised to avoid damage to the sprinklers - both before and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced.

### NOTE

*Before closing a fire protection system main control valve for maintenance work on the fire protection system which it controls, permission to shut down the affected fire protection system must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.*

It is recommended that automatic sprinkler systems be inspected quarterly by a qualified Inspection Service.

## WARRANTY

Seller warrants for a period of one year from the date of shipment (warranty period) that the products furnished hereunder will be free from defects in material and workmanship.

*For further details on Warranty, see Price List.*

## ORDERING PROCEDURE

Contact your local distributor for availability.

### Sprinkler Assemblies:

Specify: (specify temperature rating), natural brass, Model ESFR-25 Pendent Sprinkler, PSN (specify).

165°F/74°C ..... PSN 58-441-1-165  
214°F/101°C ..... PSN 58-441-1-214

### "Special Order"

#### Sprinkler Assemblies with ISO 7/1 Thread Connections:

Specify: (specify temperature rating), natural brass, Model ESFR-25 Pendent Sprinkler with thread connection per ISO 7/1, PSN (specify).

165°F/74°C ..... PSN 58-442-1-165  
214°F/101°C ..... PSN 58-442-1-214

### Sprinkler Wrench

Specify: W-Type 1 Sprinkler Wrench for use with Model ESFR-25 Pendent Sprinklers, PSN 56-872-1-025.

## PATENTS

U.S.A. Patent Number 4,580,729 is applicable to the Model ESFR-25. Other patents are pending.

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